

## WHAT IS CLAIMED IS:

1. A method of managing a non-read list associated with a storage medium, the method comprising:

5

detecting a bad portion of the storage medium;

in response to said detecting a bad portion, remapping an address of the bad portion to a new portion of the storage medium;

10

copying the data stored to the bad portion to the new portion;

if said copying is unsuccessful, adding the address of the new portion to the non-read list; and

15

inhibiting a read to the new portion if the address of the new portion is listed on the non-read list.

20

2. The method of claim 1, further comprising not adding the address of the new portion to the non-read list if said copying is successful.

3. The method of claim 1, further comprising:

25

removing the address of the new portion from the non-read list in response to a successful write to the new portion.

4. The method of claim 3, further comprising restoring data to the new portion from a backup device, wherein the successful write occurs during said restoring.

5. The method of claim 1, wherein the storage medium comprises a hard disk platter, wherein the new portion is a first sector on the hard disk platter.

6. The method of claim 1, further comprising initiating a backup of the storage medium, wherein said initiating comprises:

determining whether any addresses of any portions of the storage medium are listed on the non-read list; and

10 in response to the address of new portion being listed on the non-read list, restoring data from a backup device to the new portion of the storage medium, wherein said restoring removes the address of the new portion from the non-read list.

15 7. The method of claim 6, wherein the storage medium is comprised in a group of mirrored storage media, wherein said restoring comprises restoring the data to the other mirrored storage media in the group.

8. The method of claim 1, further comprising:  
20 detecting one or more read errors when attempting to read from the new portion of the storage medium;

25 in response to said detecting, restoring data to the new portion of the storage medium from a backup device, wherein said restoring removes the address of the new portion from the non-read list.

9. The method of claim 1, wherein the storage medium is comprised in a group of mirrored storage media, wherein said inhibiting comprises inhibiting the read from  
30 accessing the other mirrored storage media in the group.

10. The method of claim 1, further comprising listing the bad portion on a GLIST (Grown List) in response to said detecting.

5 11. The method of claim 1, wherein said inhibiting comprises returning an error indication.

12. A storage device comprising:

10 a storage medium comprising a plurality of portions, wherein each portion is identified by an address;

an access mechanism configured to access data stored on the storage medium;

15 a controller coupled to control the access mechanism, wherein the controller is configured to receive a command to access data at a first address and to responsively control the access mechanism to access a first portion of the storage medium;

20 wherein the controller is configured to inhibit read access to the first portion if the first portion's address is listed on a non-read list;

wherein the controller is configured to remove the first portion's address from the non-read list in response to a successful write to the first portion.

25

13. The storage device of claim 12, wherein the non-read list is stored on the storage medium.

14. The storage device of claim 12, wherein the storage device is a hard drive, and  
30 wherein the first portion is a first sector of a hard disk platter.

15. The storage device of claim 12, wherein the controller is further configured to list a second portion of the storage medium's address on the non-read list if:

5 a third portion of the storage medium is detected to be a bad portion;

the third portion is remapped to the second portion; and

data stored to the third portion is unsuccessfully copied to the second portion.

10

16. The data processing system of claim 12, wherein the successful write restores data to the first portion from a backup device.

15

17. The data processing system of claim 12, wherein the controller is configured to generate an error indication in response to inhibiting read access to the first portion.

18. A data processing system comprising:

a host computer system including a memory and a processor;

20

a storage array coupled to the host computer system, wherein the storage array includes a plurality of storage devices, wherein a first storage device of the plurality of storage devices has a non-read list;

25

a controller coupled to manage the non-read list;

wherein an application program stored in the memory and executed by the processor is configured to generate a read command to read data from a first portion of a storage medium included in the first storage device;

30

wherein if an address of the first portion is listed on the non-read list, the controller is configured to inhibit performance of the read command, wherein the controller is configured to remove the address of the first portion from the non-read list in response to a successful write to the first portion.

5

19. The data processing system of claim 18, wherein the controller is configured to generate an error indication in response to inhibiting performance of the read command.

10 20. The data processing system of claim 18, wherein the non-read list is stored on the storage medium.

21. The data processing system of claim 18, wherein the controller is included in a storage device controller included in the first storage device.

15

22. The data processing system of claim 18, wherein the controller is included in an array controller coupled between the host computer system and the storage array.

23. The data processing system of claim 18, wherein the controller is implemented in program instructions stored in the memory and executed by the processor.

20

24. The data processing system of claim 18, wherein the storage device is a hard drive, and wherein the first portion is a first sector of a hard disk platter.

25 25. The data processing system of claim 18, wherein the controller is further configured to add a second address of a third portion of the storage medium to the non-read list if:

a second portion of the storage medium is detected to be a bad portion;

30

the second address of the second portion is remapped to the third portion; and

data stored to the second portion is unsuccessfully copied to the third portion.

5     26.     The data processing system of claim 28, wherein the successful write restores data to the first portion from a backup device.

10     27.     The data processing system of claim 28, wherein the first storage device is included in a mirrored group of storage devices, wherein data stored on the first storage device is mirrored to other storage devices in the mirrored group, wherein the controller is configured to inhibit performance of the read command to any of the other storage devices in the mirrored group if the address of the first portion is listed on the non-read list.

15     28.     The data processing system of claim 27, wherein the successful write restores data to each storage device in the mirrored group.

20     29.     A system comprising:  
  
         means for storing data;  
  
         means for detecting that a first portion of the means for storing data cannot reliably store data;  
  
25           means for mapping the first portion of the means for storing data to a second portion of the means for storing data;  
  
         means for listing the second portion on a non-read list if data stored to the first portion is not successfully copied to the second portion; and

30

means for inhibiting read access to the second portion if the second portion is listed on the non-read list.

CONFIDENTIAL